

By the above amendment, claim 1 has been amended to incorporate the features of dependent claim 2 therein, with claims 2 and 5 being canceled in light of such amendments and claims 4 and 6 amended in the manner suggested by the Examiner to overcome the objection thereto, with claim 6 being amended to change the dependency thereof. Additionally, new dependent claims 9 and 10 dependent respectively from claims 1 and 8 have been presented in order to recite further features of the present invention.

Applicants note that by the present amendment, claims 1 and 8 recite a particular construction for a magnetic head comprising an anti-ferromagnetic layer, a ferromagnetic-pin layer, a non-magnetic intermediate layer, a soft magnetic free layer, a non-magnetic and conductive film, and an oxide layer of metal selected from Ta, Nb, Ti, Hf, W or an alloy thereof laminated in this order on a substrate, as illustrated in Fig. 1 of the drawings of this application, for example. As described at pages 4 and 5 of the specification of this application, the recited construction enables an improvement of the change of electric resistivity (ΔR) of a spin-valve type giant magnetic resistive film forming a magnetic head as defined. Such recited features provide for the following.

At first, oxide protection film (16 in Fig. 1) is disposed on the soft magnetic free layer (14) in order to improve ΔR . As the material for the oxide protective film, an oxide such as of Ta, Ni, Nb, Ti, Hf and W with Ta oxide being preferred with a view point of improving ΔR as described page 4, lines 13-18 of the specification.

Secondly, a high conductance oxidized stopper layer (15) is disposed between the oxide protective layer (16) and the soft magnetic free layer (14). The non-magnetic high conductance oxidized stopper layer prevents diffusion of oxygen from the oxide protective layer or propagation of stresses caused by oxides as far as the soft magnetic free layer and prevents degradation of the soft magnetic characteristic of the free layer. This can prevent lowering of the sensitivity of the spin

valve film and, further, prevents lowering of the output. Additionally, disposition of the conductive layer causes elastic scattering of itinerane electrons at the boundary between the non-magnetic high conductance oxidized stopper layer and oxide protective film to extend the mean free stroke length of itinerane electron to improve ΔR more than the existent spin valve structure. As the material for the non-magnetic high conductance oxidized stopper layer, Cu, Pd, Pt, Os, Rh, Re, Ru, Ag and Au are generally used, but the materials are not restricted to the foregoing so long as materials are non-magnetic and conductive as described at page 4, line 19 to page 5, line 12. In order to improve ΔR of the spin valve film, the combination of the oxide protective layer and the non-magnetic conductive film which is in the form of a non-magnetic high conductance oxidized stopper layer as recited in the independent and dependent claims of this application.

Thirdly, the thickness of the non-magnetic high conductance oxidized stopper layer is selected such that the interlayer coupling field is reduced to zero. Since the sensitivity of the spin valve film is lowered as the interlayer coupling field increases, the interlayer coupling field is desirably lower. When the non-magnetic high conductance oxidized stopper layer is disposed, the thickness of the non-magnetic high conductance oxidized stopper layer can be selected such that the interlayer coupling field is substantially reduced to zero since the interlayer coupling field changes along with the thickness of the conductive layer. This can prevent lowering of the sensitivity caused by increase in the interlayer coupling field as described at page 5, lines 13 - 25 of the specification.

Applicants note that the specification and drawings provide detail analysis of magnetic heads with and without the aforementioned features evidencing the improvement obtained by the claimed construction which is not disclosed or taught in the cited art, as will become apparent from the following discussion.

The rejection of claims 1-7 under 35 U.S.C. 103(a) as being unpatentable over Saito et al, US patent (6,221,172) in view of Hayashi, US patent (6,133,732) and the rejection of claim 8 under 35 U.S.C. 103(a) as being unpatentable over Dorius et al, US patent (6,069,769) in view of Saito et al, US patent (6,221,172) and further in view of Hayashi, US patent (6,133,732), such rejections are traversed insofar as they are applicable to the present claims, and reconsideration and withdrawal of the rejections are respectfully requested.

At the outset, as to the requirements to support a rejection under 35 U.S.C. 103, reference is made to the decision of In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988), wherein the court pointed out that the PTO has the burden under §103 to establish a prima facie case of obviousness and can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Furthermore, such requirements have been clarified in the recent decision of In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002) wherein the court in reversing an obviousness rejection indicated that deficiencies of the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge".

The court pointed out:

The Examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation

would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is immaterial to patentability, and could not be resolved on subjected belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. (emphasis added)

In setting forth the decision, the Examiner recognizes that "Saito et al do not teach that the metal layer (protecting layer) is an oxide layer of metal or an alloy." (emphasis added) To overcome this deficiency, the Examiner contends that "Hayashi teach that the protective layer [18] is an oxide metal or an alloy (see Fig. 2 and col. 14, lines 52-60 and col. 16, lines 21-29)." The Examiner thus concludes that "It would have been obvious to one of ordinary skill in the magnetoresistive art at the time the invention was made to modify the of metal layer (protecting film) as taught by Saito et al by an oxide metal layer as taught by Hayashi because the modification would improve the corrosion resistance (see Hayashi, col. 14, lines 52-60)." (emphasis added)

Irrespective of the position set forth by the Examiner, applicants submit that the present invention is not directed to improving the corrosion resistance, but rather provides the combination of the metal oxide layer and the non-magnetic conductive film in the form of a non-magnetic conductive oxidized stopper layer, as claimed, to improve ΔR of the spin valve film which is not disclosed or taught by Saito et al or Hayashi irrespective of the Examiner's position. Moreover, applicants submit that the proposed combination represents a hindsight reconstruction attempt in complete disregard of the teachings of the individual references, utilizing the principle of "obvious to try" which is not the standard of 35 U.S.C. 103. See In re Fine, supra.

Looking to Hayashi, applicants note that this patent discloses that the protection layer 18 formed on a free magnetic layer 17 without any layer interposed therebetween, and the alleged corrosion resistance improvement is obtained by the claimed structure of the use of a protective film as pointed out in col. 14, lines 55-60. That is, "If, however, the protection layer 18 is not formed, then the corrosion resistance is reduced although the fabrication processes are reduced." (emphasis added) Thus, Hayashi teaches the utilization of a protection layer for corrosion resistance and as described in col. 14, lines 54-56, "the protection layer 18 may also be made of one selected from the group consisting of Cu, Au, Tg, Ta, Hf, Zr, Ir, Si, Pt, Ti, Cr, Al, and C and mixtures thereof." (emphasis added) which correspond to the metal protective layer of Saito et al. While Hayashi does describe that the protection layer 18 may be made of oxide or nitride of the group consisting of Al, Si, Ta, and Ti, this only provides a disclosure of possible construction of the protection layer and provides no disclosure or teaching of the requirement for utilizing an oxide metal layer as a protection layer in combination with a non-magnetic conductive film, as recited in each of independent claims 1 and 8 and the dependent claims thereof. As such, applicants submit that the proposed combination represents a hindsight reconstruction attempt which is not proper and it cannot be considered obvious in the sense of 35 U.S.C. 103 to provide the recited features as set forth in independent claims 1 and 8 and the dependent claims in the sense of 35 U.S.C. 103, such that these claims patentably distinguish over the cited art and should be considered allowable thereover.

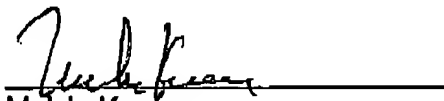
Applicants note that with respect to the thickness of the metal oxide layer, it is readily apparent that the cited art provides no disclosure or teaching thereof with the Examiner contending that such would be an obvious design choice. Applicants submit that this position by the Examiner has been rejected by the court in the decision of In re Lee, supra.

With respect to the addition of Dorius et al, as recognized by the Examiner, Dorius et al does not disclose or teach a magnetic head having the features as claimed, such that the combination fails to provide the claimed features as set forth in claim 8 and the dependent claims. Accordingly, claim 8 and the dependent claims patentably distinguish over this proposed combination of references in the sense of 35 U.S.C. 103 and should be considered allowable thereover.

In view of the above amendments and remarks, applicants submit that all claims present in this application patentably distinguish over the cited art and should now be in condition for allowance. Accordingly, issuance of an action of a favorable nature is courteously solicited.

To the extent necessary, applicant's petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (501.39395X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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